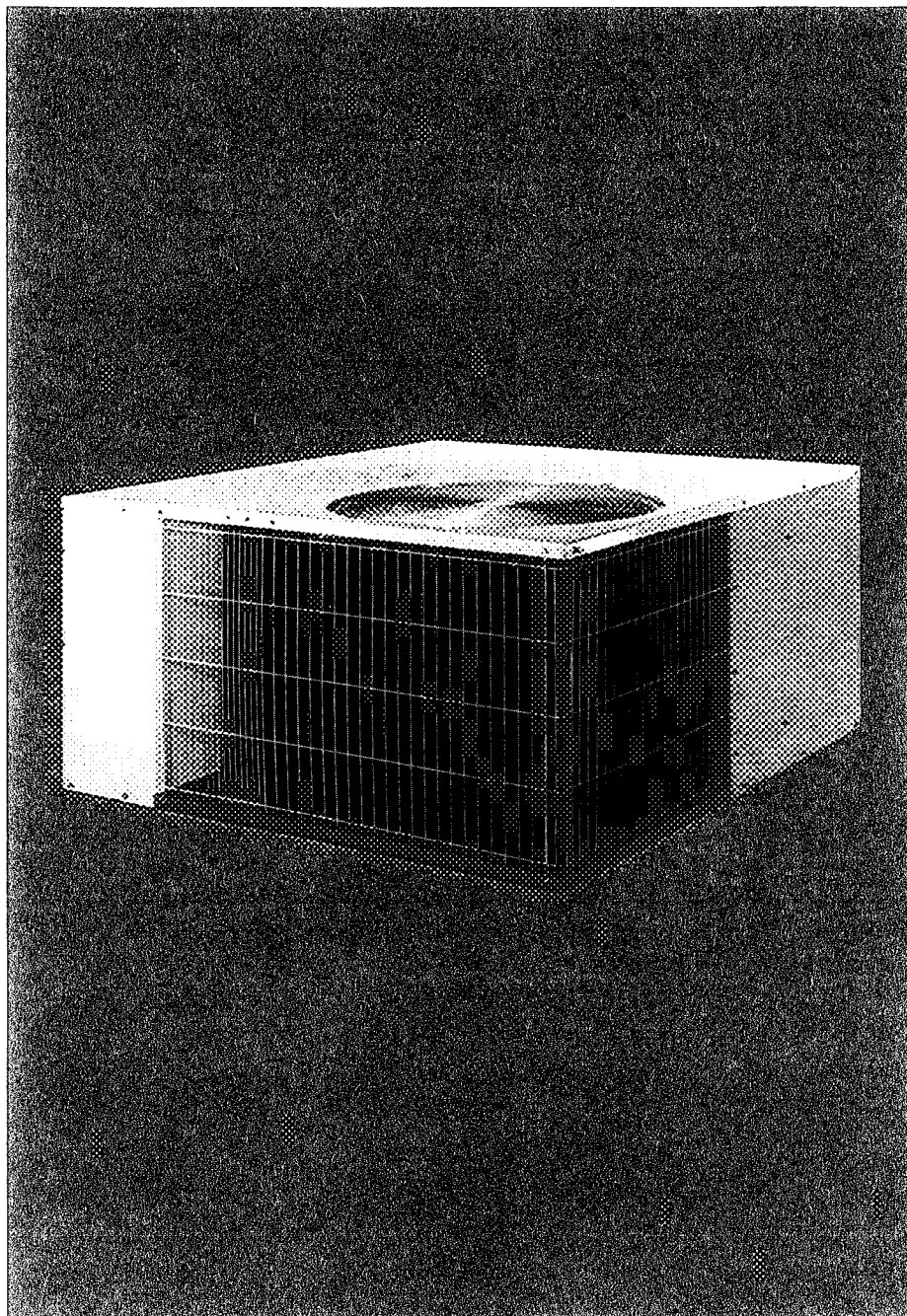




## Product Data

# 50YX High Efficiency Single-Package Heat Pumps

1-1/2 to 5 Nominal Tons



Single-Package Heat Pump Units with the following Premium Features as Standard:

- scroll compressors with internal high-pressure and overcurrent protection
- thermostatic expansion valves
- low-pressure switch
- high efficiency operation

Accessories:

- single point box kit
- electric heaters

## Features/Benefits

**Compact, fully self-contained, all-electric, combination heating/cooling unit is prewired, prepiped, and precharged for minimum installation expense.**

### Easy installation

Round side-by-side duct configuration on 018-042 units and rectangular configuration on 048-060 units. Models install easily on a rooftop or a ground-level pad.

### Efficient operation

Rugged, efficient scroll compressors are specifically designed for high efficiency, improved reliability, and quiet operation. Each compressor is mounted on rubber isolators for additional sound reduction. All compressors have internal high-pressure, overtemperature, and overcurrent protection.

These high efficiency units not only save electricity by lowering electric bills, they are also eligible for utility rebates offered for high efficiency units.

Indoor-fan motors have been carefully selected to minimize energy-consumption and to withstand the heavy-duty, year-round operation required by heat pumps. These motors are designed to meet the requirements of a wide variety of residential and light commercial applications.

Direct-drive, PSC (permanent split capacitor), outdoor-fan motors have been selected to help reduce energy consumption. Units are designed for cooling operation down to 55 F

Built-in reliability components include a *low-pressure switch* that stops the compressor if the refrigerant pressure drops to an unsafe operating level, a *discharge thermostat* on the compressor which protects against overheating, a *thermostatic expansion valve* (TXV) which keeps liquid refrigerant from flooding into the compressor and ensures optimum performance

under all conditions, and a *compressor time-delay* which prevents the compressor from attempting to restart for 5 minutes after shutdown, to allow for pressure equalization

Indoor and outdoor coils are computer designed for optimum heat transfer. Vertical outdoor-fan discharge carries sound and air up and away. The high-voltage inlet panel is designed to accommodate a field-installed electrical disconnect. A low-voltage terminal block simplifies thermostat connections. Refrigerant service connections make checking operating pressures easier

Time/temperature defrost system is used to increase heating cycle efficiency. This type of defrost system has proven to be very reliable. The time/temperature control “looks” for coil icing conditions only at preset time

intervals, start the defrost cycle only if the defrost thermostat senses icing conditions, and automatically ends the defrost cycle when the coil has warmed sufficiently to melt the ice.

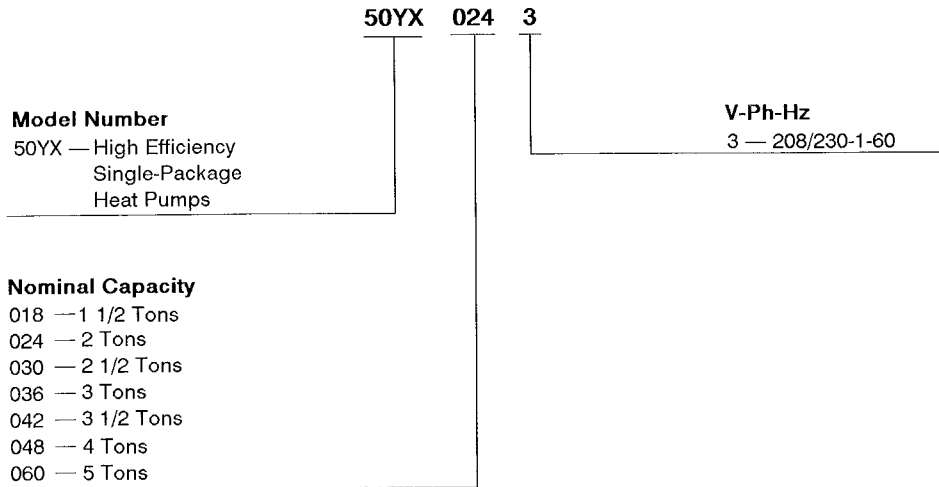
A separate power supply is not required for electric heaters when an accessory single point box kit is used. This accessory provides for a single power supply for the packaged unit and accessory electric heater packages, and functions as an NEC (National Electrical Code) approved fused disconnect

Weatherized cabinets are constructed of heavy-duty, phosphated, zinc-coated steel, and are finished with corrosion-resistant baked enamel. Interior surfaces of the blower section are insulated to help keep the conditioned air from being affected by the outdoor ambient temperature

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# Model number nomenclature



## ARI capacities

### COOLING AND HEATING CAPACITIES AND EFFICIENCIES

UNIT 50YX	NOMINAL TONS	STANDARD CFM	NET COOLING* CAPACITIES AT 95 F (Btuh)	SEER*	NET HEATING* CAPACITIES AT 47 F (Btuh)	COP* AT 47 F	NET HEATING* CAPACITIES AT 17 F (Btuh)	COP* AT 17 F	HSPF	SOUND RATINGS† (Bels)
018	1½	600	18,500	12.0	17,200	3.0	9,300	1.8	7.0	7.6
024	2	900	24,800	12.0	21,500	3.0	12,000	1.8	7.0	7.6
030	2½	1100	31,000	12.1	29,000	3.1	16,800	2.0	7.1	8.0
036	3	1300	35,800	12.0	34,000	3.0	19,000	1.9	7.0	8.0
042	3½	1400	41,500	12.0	38,600	3.2	21,500	2.0	7.0	8.2
048	4	1600	48,500	12.0	46,000	3.2	27,000	2.0	7.3	8.0
060	5	2000	60,000	11.0	54,500	3.0	31,000	1.9	7.0	8.0

#### LEGEND

- ARI** — Air-Conditioning & Refrigeration Institute
- Bels** — Sound Levels (1 bel = 10 decibels)
- COP** — Coefficient of Performance
- DOE** — Department of Energy
- HSPF** — Heating Seasonal Performance Factor
- SEER** — Seasonal Energy Efficiency Ratio

\*Rated in accordance with ARI Standard 210/240-89 and/or U.S. Government DOE test procedures

†Rated in accordance with ARI Standard 270-84

NOTE. Ratings are net values, reflecting the effects of circulating fan heat. Ratings are based on cooling standard 80 F db, 67 F wb indoor entering-air temperature and 95 F db outdoor entering-air temperature.



# Physical data

UNIT 50YX	018	024	030	036	042	048	060
REFRIGERANT (R-22)* Refrigerant Control	TXV						
UNIT WEIGHT (lb)	330	336	340	350	407	423	432
COMPRESSOR	Scroll						
INDOOR FAN	Centrifugal — Direct Drive						
Speeds	2	2	2	2	2	3	2
Rpm	840	840	840	840	840	1100	1100
Diameter (in.)	10	12	12	12	12	12	12
Width (in.)	6	6	6	6	6	6	6
Nominal Range (cfm)	525-750	700-1000	875-1250	1050-1500	1100-1650	1400-1800	1750-2400
Motor Hp	1/4	1/3	1/3	1/2	1/2	1/2	3/4
INDOOR COIL	Propeller — Direct Drive						
Rows...Fins/in.	3 .15	3 .15	3 .15	3...15	3 .15	3 .15	4...15
Face Area (sq ft)	3.4	3.4	3.4	4.7	6.0	6.5	6.4
OUTDOOR FAN	Propeller — Direct Drive						
Cfm	2200	2200	2700	2700	3200	3200	3400
Rpm	840	840	1100	1100	1100	1100	1100
Diameter (in.)	22	22	22	22	22	22	22
Motor Hp	1/8	1/4	1/4	1/4	1/4	1/4	1/2
OUTDOOR COIL	Propeller — Direct Drive						
Rows...Fins/in.	2 .17	2 .17	2 .20	2 .20	2...17	2 .17	2 .17
Face Area (sq ft)	8.3	8.3	8.3	9.6	12.0	12.7	12.7
FILTER SIZE (in.)†							
(Qty) Throwaway	(1) 20 x 25	(1) 20 x 25	(2) 15 x 20	(1) 15 x 20 (1) 20 x 20	(2) 20 x 20	(1) 20 x 25 (1) 25 x 25	(1) 20 x 25 (1) 25 x 25
(Qty) Permanent	(1) 15 x 20	(1) 15 x 20	(2) 20 x 20	(2) 20 x 25	(2) 20 x 25	(2) 20 x 20	(2) 20 x 20

## LEGEND

TXV — Thermostatic Expansion Valve

\*Operating charge is listed on unit nameplate.

†Recommended field-supplied filters are one-in thick.

# Accessories

**Electric heaters** that mount inside the heat pump indoor-fan compartment are available in a variety of kW and voltage options. Each heater assembly includes automatic-reset switch, and heat limiters for primary and secondary, over-current, and thermal protection

**Single point box** allows for a single power supply for the base unit and accessory electric heater, and functions as an NEC-approved fused disconnect

**Service Sentry™ kit** provides immediate warning when the compressor fails to operate after a call for heating or cooling. The control energizes a warning light located on the indoor thermostat

**Outdoor thermostat kit** allows for staging of electric heaters based on outdoor-air temperature

**Thermostat and Subbase** provides heating and cooling unit control. Automatic and manual changeover types are available

ACCESSORY	PART NO.	
Electric Heater	5.0 kW	88EM0050MA00
	7.5 kW	88EM0075MA00
	10.0 kW	88EM0100MA00
	15.0 kW	88EM0150MA00
	20.0 kW	88EM0200MA00
Single Point Box For 5.0-kW Heaters (Unit Sizes 018,024)	50YX-900---001	
For 7.5- and 10.0-kW Heaters (Unit Sizes 018,024); For 5.0-kW Heaters (Unit Sizes 030-060)	50YX-900---002	
For 7.5- and 10.0-kW Heaters (Unit Sizes 030-048)	50YX-900---003	
For 15.0-kW Heaters (Unit Sizes 030-060); For 20.0-kW Heaters (Unit Sizes 036-060)	50YX-900---004	
Thermostat and Subbase Autochangeover	99TZ-900---521	
Thermostat and Subbase, Manual Changeover	99TZ-900---571	
Service Sentry™ Kit	50LQ-900---011	
Outdoor Thermostat	50LQ-900---001	

# Dimensions

**REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL, INCHES (mm)**

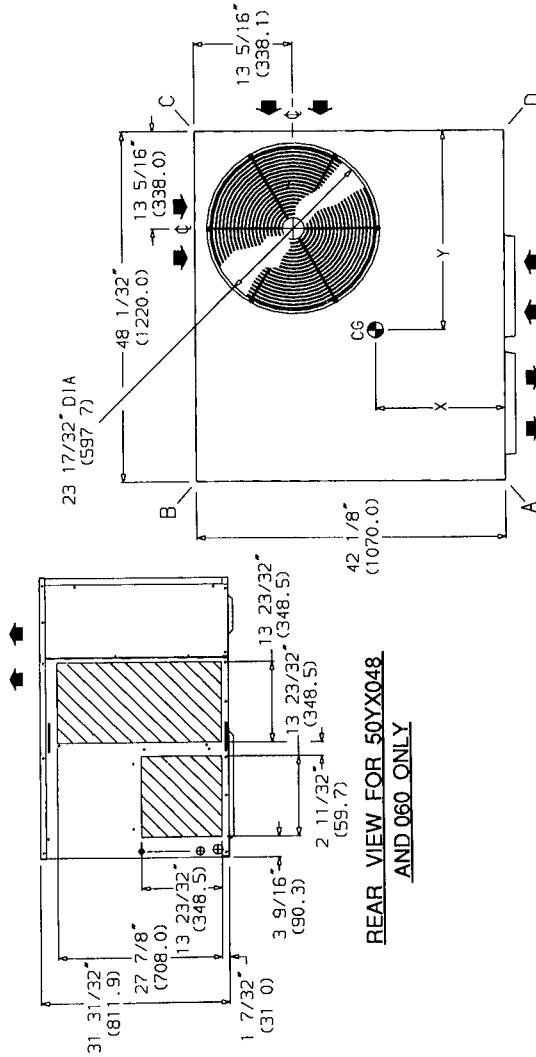
- Maximum Extension of Overhang 48 (1219.2)
- Unit Top 36 (914.4)
- Duct Side of Unit 6 mm. (152.4 mm)
- Side Opposite Ducts 30 (762.0)
- Bottom of Unit .0

**REQUIRED CLEARANCES FOR SERVICING, INCHES (mm)**

- Indoor-Fan Access Panel Side 30 (762.0)
- Control Box Access Side 30 (762.0)

**NOTES:**

- Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
- CG is center of gravity.
- Dimensions in ( ) are in millimeters.

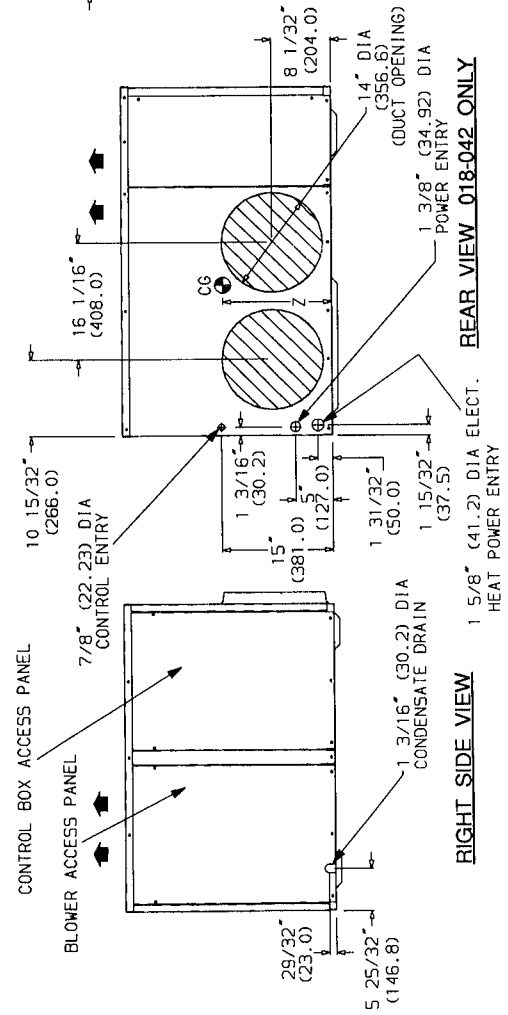


**REAR VIEW FOR 50YX048 AND 060 ONLY**

UNIT 50YX	ELECTRICAL CHARACTERISTICS	HEIGHT	UNIT WT.			CORNER WT Lb/Kg		
			Lb/Kg	A	B	C	D	
018	208/230-1-60	22 <sup>3</sup> / <sub>32</sub> " (561.2)	330/150	68/31	82/37	73/33	107/49	
024	208/230-1-60	22 <sup>3</sup> / <sub>32</sub> " (561.2)	336/152	69/31	83/38	76/34	108/49	
030	208/230-1-60	340/154	340/154	70/32	83/38	79/36	109/49	
036	208/230-1-60	24 <sup>1</sup> / <sub>2</sub> " (622.3)	350/159	71/32	85/39	84/38	110/50	
042	208/230-1-60	24 <sup>1</sup> / <sub>2</sub> " (622.3)	407/185	86/39	98/45	100/45	123/56	
048	208/230-1-60	32 <sup>1</sup> / <sub>16</sub> " (833.4)	423/192	92/42	99/45	108/49	124/56	
060	208/230-1-60	432/196	432/196	95/43	96/44	110/50	131/60	

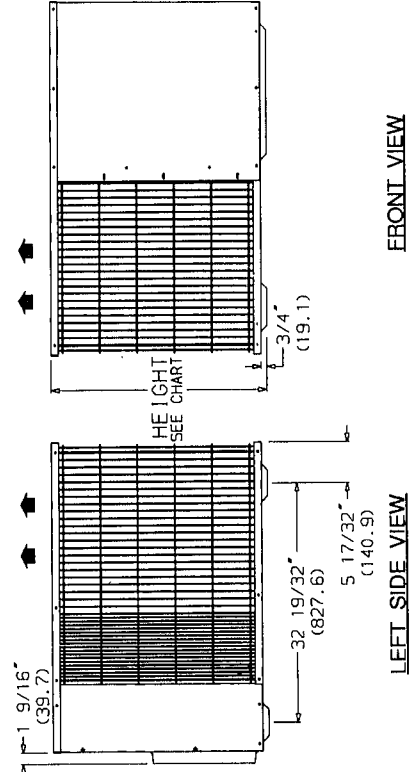
UNIT 50YX	CENTER OF GRAVITY in./mm		
	X	Y	Z
018	19 <sup>3</sup> / <sub>4</sub> " (501.7)	21 <sup>1</sup> / <sub>8</sub> " (555.6)	10 <sup>1</sup> / <sub>4</sub> " (260.4)
024	19 <sup>7</sup> / <sub>8</sub> " (504.8)	21 <sup>3</sup> / <sub>4</sub> " (552.5)	10 <sup>1</sup> / <sub>4</sub> " (260.4)
030	20 <sup>1</sup> / <sub>16</sub> " (509.6)	21 <sup>1</sup> / <sub>2</sub> " (546.1)	10 <sup>9</sup> / <sub>16</sub> " (261.9)
036	20 <sup>7</sup> / <sub>16</sub> " (519.1)	21 <sup>9</sup> / <sub>16</sub> " (547.7)	11 <sup>1</sup> / <sub>2</sub> " (292.1)
042	20 <sup>1</sup> / <sub>2</sub> " (520.7)	21 <sup>3</sup> / <sub>4</sub> " (552.5)	13 <sup>3</sup> / <sub>4</sub> " (349.3)
048	20 <sup>5</sup> / <sub>8</sub> " (523.9)	21 <sup>3</sup> / <sub>4</sub> " (552.5)	15 <sup>5</sup> / <sub>8</sub> " (356.9)
060	20 <sup>1</sup> / <sub>8</sub> " (511)	21 <sup>1</sup> / <sub>4</sub> " (540)	15 <sup>1</sup> / <sub>8</sub> " (384)

UNIT 50YX	HEATER PART NO.	KW @ 240 V
018-060	88EM0050MA00	5.0
	88EM0075MA00	7.5
	88EM0100MA00	10.0
030-060	88EM0150MA00	15.0
036-060	88EM0200MA00	20.0
060	88EM0250MA00	25.0



**RIGHT SIDE VIEW**

**REAR VIEW 018-042 ONLY**



**LEFT SIDE VIEW**

**FRONT VIEW**

# Selection procedure

## I Determine cooling and heating requirements at design conditions.

Given:

Required Cooling Capacity (TC)	28,000 Btuh
Sensible Heat Capacity (SHC)	20,500 Btuh
Required Heating Capacity	30,000 Btuh
Outdoor Entering-Air Temperature	95 F
Outdoor-Air Winter Design Temperature	20 F
Indoor-Air Winter Design Temperature	70 F
Indoor Entering-Air Temperature	80 F edb, 67 F ewb
Indoor-Air Quantity	1125 cfm
External Static Pressure	0.40 in. wg
Field-Supplied Filter Pressure Drop	0.15 in. wg
Electrical Characteristics (V-Ph-Hz)	230-1-60

## II Select unit based on required cooling capacity.

Enter Cooling Capacities table at condenser entering temperature of 95 F, indoor air entering at 1125 cfm and 67 F ewb (entering wet bulb). The 50YX030 unit will provide a total cooling capacity of 31,000 Btuh and a sensible heat capacity of 24,400 Btuh.

For indoor-air temperature other than 80 F edb (entering dry bulb), calculate sensible heat capacity correction, as required, using the formula found in Note 3 following the cooling capacities tables.

NOTE: Unit ratings are net capacities.

## III Select electric heat.

Enter the Heating Capacities table at 1125 cfm. At 70 F return indoor air and 20 F air entering outdoor coil, the integrated heating capacity is 16,200 Btuh. (Select integrated heating capacity value since deductions for outdoor-coil frost and defrosting have already been made. No correction is required.)

The required heating capacity is 30,000 Btuh. Therefore, 13,800 Btuh (30,000 – 16,200) additional electric heat is required.

Determine additional electric heat capacity in kW

$$\frac{13,800 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 4.0 \text{ kW of heat required}$$

Enter the Electric Heater Packages table for 50YX030 unit. The 5-kW heater at 240 v most closely satisfies the heating required. To calculate kW at 230 v.

$$5 \text{ kW} \times .92 = 4.6 \text{ kW}$$

$$5 \text{ kW} \times .92 \times 3414 = 15,704 \text{ Btuh}$$

To calculate kW at 208 v, see note below Electric Heater Packages table on page 13.

Total unit heating capacity is 31,904 Btuh (16,200 + 15,704).

## IV Determine fan speed and power requirements at design conditions.

Before entering Air Delivery tables, calculate the total static pressure required. From the given and the Electric Heat Accessory Pressure Drop table, find:

External static pressure	0.40 in. wg
Filter	0.15 in. wg
Electric heat	0.04 in. wg
Total static pressure	0.59 in. wg

Enter the Air Delivery table, page 12, at 1125 cfm and 230-v high speed for wet coil. By interpolation, the standard motor will deliver 0.65 in. wg static pressure. This will adequately handle job requirements.

# Performance data

## COOLING CAPACITIES

### 50YX018 (1½ Tons)

Temp (F) Air Ent Cond	Evap Air — Cfm/BF												
	525/0.07				675/0.09				750/0.10				
	Evap Air — Ewb (F)												
	72	67	63*	62	72	67	63*	62	72	67	63*	62	
85	TC	20.4	18.6	17.4	17.1	21.1	19.3	18.0	17.8	21.3	19.5	18.2	18.2
	SHC	10.2	12.9	12.6	15.6	11.2	14.5	14.1	17.6	11.6	15.3	14.8	18.2
	kW	1.60	1.58	1.58	1.57	1.64	1.63	1.62	1.62	1.66	1.65	1.64	1.64
95	TC	19.6	17.9	16.7	16.4	20.2	18.5	17.3	17.2	20.3	18.7	17.4	17.6
	SHC	9.94	12.6	12.3	15.3	10.9	14.2	13.8	17.2	11.3	15.0	14.5	17.6
	kW	1.76	1.74	1.73	1.73	1.80	1.78	1.77	1.77	1.82	1.80	1.79	1.79
105	TC	18.7	17.2	16.0	15.7	19.3	17.7	16.5	16.6	19.5	17.9	16.6	17.0
	SHC	9.62	12.3	12.0	14.9	10.6	13.9	13.5	16.6	11.0	14.7	14.2	17.0
	kW	1.92	1.91	1.89	1.89	1.97	1.95	1.94	1.94	1.99	1.97	1.96	1.96
115	TC	17.9	16.4	15.2	15.0	18.4	16.9	15.6	15.9	18.5	17.0	15.8	16.3
	SHC	9.31	12.0	11.6	14.5	10.3	13.6	13.1	15.9	10.7	14.4	13.8	16.3
	kW	2.11	2.09	2.07	2.07	2.16	2.14	2.12	2.13	2.17	2.16	2.14	2.14

### 50YX030 (2½ Tons)

Temp (F) Air Ent Cond	Evap Air — Cfm/BF												
	1000/0.06				1125/0.07				1250/0.08				
	Evap Air — Ewb (F)												
	72	67	63*	62	72	67	63*	62	72	67	63*	62	
85	TC	34.8	31.9	29.8	29.4	35.1	32.2	30.1	29.9	35.6	32.7	30.5	30.8
	SHC	18.1	23.5	22.8	28.5	18.9	24.8	24.1	29.9	19.7	26.3	25.3	30.8
	kW	2.66	2.63	2.62	2.61	2.70	2.68	2.66	2.66	2.75	2.73	2.71	2.72
95	TC	33.5	30.7	28.6	28.3	33.8	31.0	28.9	29.0	34.3	31.5	29.3	29.8
	SHC	17.6	23.0	22.3	27.9	18.4	24.4	23.6	29.0	19.3	25.8	24.8	29.8
	kW	2.89	2.87	2.85	2.84	2.94	2.91	2.90	2.90	3.00	2.97	2.94	2.95
105	TC	32.1	29.4	27.4	27.2	32.7	29.7	27.7	28.0	32.9	30.2	28.0	28.7
	SHC	17.1	22.5	21.8	27.2	18.0	23.9	23.1	28.0	18.8	25.3	24.3	28.7
	kW	3.16	3.13	3.11	3.10	3.22	3.18	3.16	3.16	3.26	3.23	3.21	3.21
115	TC	30.7	28.2	26.2	26.3	31.2	28.4	26.5	27.0	31.4	28.8	26.8	27.7
	SHC	16.7	22.0	21.3	26.3	17.5	23.4	22.5	27.0	18.3	24.8	23.8	27.7
	kW	3.45	3.42	3.40	3.40	3.51	3.47	3.44	3.45	3.56	3.53	3.50	3.51

### 50YX024 (2 Tons)

Temp (F) Air Ent Cond	Evap Air — Cfm/BF												
	800/0.05				900/0.05				1000/0.06				
	Evap Air — Ewb (F)												
	72	67	63*	62	72	67	63*	62	72	67	63*	62	
85	TC	27.9	25.6	23.8	23.5	28.2	25.8	24.1	24.0	28.5	26.0	24.3	24.6
	SHC	14.6	18.9	18.3	23.0	15.2	20.1	19.4	24.0	15.9	21.2	20.4	24.6
	kW	2.12	2.12	2.12	2.12	2.16	2.16	2.16	2.16	2.20	2.19	2.19	2.19
95	TC	26.8	24.5	22.7	22.6	27.1	24.8	23.1	23.3	27.3	25.0	23.3	23.8
	SHC	14.2	18.5	17.9	22.5	14.8	19.7	19.0	23.3	15.5	20.8	20.0	23.8
	kW	2.34	2.33	2.33	2.33	2.37	2.37	2.37	2.37	2.41	2.41	2.40	2.40
105	TC	25.7	23.5	21.7	21.8	26.0	23.8	22.1	22.5	26.1	23.9	22.3	23.0
	SHC	13.8	18.1	17.5	21.8	14.5	19.3	18.6	22.5	15.1	20.4	19.6	23.0
	kW	2.58	2.57	2.56	2.57	2.61	2.61	2.61	2.61	2.65	2.64	2.64	2.64
115	TC	24.5	22.4	20.8	20.9	24.6	22.6	21.1	21.5	24.8	22.9	21.3	22.1
	SHC	13.4	17.7	17.1	20.9	14.0	18.8	18.2	21.5	14.7	19.9	19.2	22.1
	kW	2.84	2.83	2.83	2.83	2.87	2.87	2.87	2.86	2.91	2.91	2.91	2.91

### 50YX036 (3 Tons)

Temp (F) Ent Cond	Evap Air — Cfm/BF												
	1200/0.13				1350/0.14				1500/0.16				
	Evap Air — Ewb (F)												
	72	67	63*	62	72	67	63*	62	72	67	63*	62	
85	TC	40.3	36.8	34.3	33.8	40.6	37.3	34.8	34.5	41.0	37.6	35.1	35.1
	SHC	20.7	26.7	25.9	32.3	21.5	28.2	27.3	34.0	22.3	29.6	28.7	35.1
	kW	3.17	3.13	3.10	3.09	3.21	3.19	3.16	3.15	3.27	3.24	3.22	3.21
95	TC	38.6	35.4	33.0	32.6	39.1	35.8	33.4	33.2	39.5	36.1	33.7	34.0
	SHC	20.1	26.1	25.3	31.6	21.0	27.6	26.7	33.1	21.8	29.0	28.1	34.0
	kW	3.47	3.43	3.40	3.40	3.53	3.48	3.46	3.46	3.58	3.54	3.52	3.52
105	TC	37.0	33.9	31.6	31.3	37.4	34.3	32.0	32.0	37.7	34.5	32.2	32.8
	SHC	19.5	25.6	24.7	30.8	20.4	27.0	26.1	32.0	21.2	28.4	27.4	32.8
	kW	3.80	3.77	3.74	3.73	3.85	3.82	3.80	3.80	3.91	3.87	3.85	3.86
115	TC	35.4	32.4	30.1	29.9	35.7	32.7	30.4	30.7	35.8	32.9	30.6	31.4
	SHC	19.0	25.0	24.1	29.9	19.8	26.4	25.4	30.7	20.6	27.8	26.7	31.4
	kW	4.18	4.14	4.10	4.10	4.24	4.19	4.15	4.17	4.27	4.24	4.20	4.22

#### LEGEND

- BF — Bypass Factor
- Edb — Entering Dry-Bulb
- Ewb — Entering Wet-Bulb
- kW — Total Unit Power Input
- Ldb — Leaving Dry-Bulb
- Lwb — Leaving Wet-Bulb
- SHC — Sensible Heat Capacity (1000 Btuh) Net
- TC — Total Capacity (1000 Btuh) Net

\*At 75 F entering dry bulb (Tennessee Valley Authority [TVA] rating conditions); all others at 80 F entering dry bulb.

#### NOTES:

- 1 Direct interpolation is permissible. Do not extrapolate
- 2 The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

$t_{lwb}$  = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil ( $h_{lwb}$ )

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where:  $h_{ewb}$  = Enthalpy of air entering evaporator coil

- 3 The SHC is based on 80 F edb temperature of air entering evaporator coil  
Below 80 F edb, subtract (corr factor x cfm) from SHC.  
Above 80 F edb, add (corr factor x cfm) to SHC.  
Correction Factor =  $1.10 \times (1 - BF) \times (edb - 80)$

# Performance data (cont)

## COOLING CAPACITIES (cont)

### 50YX042 (3½ Tons)

Temp (F) Air Ent Cond	Evap Air — Cfm/BF												
	1225/0.05				1400/0.06				1650/0.07				
	Evap Air — Ewb (F)												
	72	67	63*	62	72	67	63*	62	72	67	63*	62	
85	TC	46.5	42.7	39.9	39.3	47.1	43.3	40.5	40.1	47.7	43.9	41.3	41.4
	SHC kW	23.6	30.3	29.5	36.8	24.8	32.3	31.4	39.4	26.4	35.1	34.0	41.4
95	TC	44.4	40.9	38.2	37.5	44.9	41.5	38.8	38.5	45.7	42.1	39.3	40.0
	SHC kW	22.9	29.6	28.8	36.0	24.0	31.6	30.7	38.4	25.7	34.4	33.2	40.0
105	TC	42.4	39.1	36.5	35.9	42.9	39.6	37.0	37.0	43.6	40.1	37.5	38.5
	SHC kW	22.2	28.9	28.1	35.1	23.3	30.9	29.9	37.0	25.0	33.6	32.4	38.5
115	TC	40.3	37.0	34.5	34.2	40.7	37.4	34.9	35.3	41.4	38.1	35.5	36.7
	SHC kW	21.5	28.1	27.2	34.1	22.6	30.0	29.0	35.3	24.3	32.8	31.6	36.7

### 50YX048 (4 Tons)

Temp (F) Air Ent Cond	Evap Air — Cfm/BF												
	1400/0.05				1600/0.06				1800/0.06				
	Evap Air — Ewb (F)												
	72	67	63*	62	72	67	63*	62	72	67	63*	62	
85	TC	53.5	49.0	45.6	44.8	54.4	49.9	46.5	45.8	55.1	50.5	47.1	46.7
	SHC kW	26.4	33.6	32.7	40.6	27.7	35.8	34.8	43.5	28.9	37.9	36.7	46.0
95	TC	51.4	47.1	43.8	43.0	52.3	47.9	44.6	44.0	52.9	48.5	45.2	44.9
	SHC kW	25.7	32.8	31.9	39.7	26.9	35.0	33.9	42.5	28.1	37.1	35.9	44.8
105	TC	49.3	45.0	41.9	41.2	50.0	45.8	42.6	42.2	50.4	46.3	43.0	43.2
	SHC kW	24.9	32.0	31.1	38.8	26.1	34.2	33.1	41.5	27.2	36.2	35.0	43.2
115	TC	47.0	42.9	39.9	39.3	47.7	43.5	40.4	40.2	47.9	43.9	40.8	41.3
	SHC kW	24.1	31.1	30.2	37.8	25.3	33.3	32.1	40.2	26.4	35.3	34.0	41.3

### 50YX060 (5 Tons)

Temp (F) Air Ent Cond	Evap Air — Cfm/BF												
	1750/0.02				2000/0.02				2250/0.03				
	Evap Air — Ewb (F)												
	72	67	63*	62	72	67	63*	62	72	67	63*	62	
85	TC	67.5	61.5	57.0	56.0	68.4	62.3	57.9	57.2	68.9	62.8	58.4	58.9
	SHC kW	33.8	43.8	42.4	53.4	35.5	46.8	45.3	57.1	37.1	49.7	48.0	58.9
95	TC	64.8	59.0	54.7	53.7	65.8	60.0	55.4	55.2	66.3	60.5	56.1	56.8
	SHC kW	32.9	42.8	41.4	52.3	34.6	45.9	44.2	55.2	36.3	48.8	47.0	56.8
105	TC	62.1	58.5	52.2	51.4	62.8	57.3	53.1	53.3	63.2	57.7	53.5	54.8
	SHC kW	31.9	41.8	40.4	51.1	33.6	44.8	43.2	53.3	35.2	47.7	45.9	54.8
115	TC	69.1	63.7	59.6	59.2	69.7	64.4	60.3	60.0	70.0	64.7	60.7	62.4
	SHC kW	30.9	40.7	39.2	49.2	32.5	43.7	42.1	51.0	34.2	46.6	44.7	52.4

#### LEGEND

- BF — Bypass Factor
- Edb — Entering Dry-Bulb
- Ewb — Entering Wet-Bulb
- kW — Total Unit Power Input
- Ldb — Leaving Dry-Bulb
- Lwb — Leaving Wet-Bulb
- SHC — Sensible Heat Capacity (1000 Btuh) Net
- TC — Total Capacity (1000 Btuh) Net

\*At 75 F entering dry bulb (Tennessee Valley Authority [TVA] rating conditions); all others at 80 F entering dry bulb.

#### NOTES:

- 1 Direct interpolation is permissible. Do not extrapolate.
- 2 The following formulas may be used:

$$t_{ldb} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

$$t_{lwb} = \text{Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil } (h_{lwb})$$

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where:  $h_{ewb}$  = Enthalpy of air entering evaporator coil

- 3 The SHC is based on 80 F edb temperature of air entering evaporator coil.

Below 80 F edb, subtract (corr factor x cfm) from SHC.  
Above 80 F edb, add (corr factor x cfm) to SHC

$$\text{Correction Factor} = 1.10 \times (1 - \text{BF}) \times (\text{edb} - 80)$$



## HEATING CAPACITIES

### 50YX018 (1 1/2 Tons)

Cfm (Std Air)	Return Air (F db)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
			-10	0	10	17	20	30	40	47	50	60										
525	60	Cap.	4.68	4.30	6.17	5.68	7.92	7.27	9.34	8.51	9.98	9.05	12.3	10.8	15.1	15.1	17.2	17.2	18.1	18.1	21.6	21.6
		kW	1.26	1.32	1.37	1.41	1.43	1.48	1.54	1.59	1.61	1.69	1.85	2.03	2.13	2.13	2.16	2.16	2.18	2.18	2.22	2.22
	70	Cap.	4.56	4.20	6.03	5.55	7.77	7.13	9.19	8.38	9.86	8.94	12.2	10.7	14.9	14.9	17.0	17.0	17.9	17.9	21.3	21.3
		kW	1.36	1.43	1.49	1.53	1.55	1.62	1.69	1.74	1.76	1.85	2.03	2.13	2.13	2.16	2.16	2.18	2.18	2.22	2.22	2.22
	80	Cap.	4.47	4.11	5.92	5.44	7.66	7.03	9.11	8.31	9.78	8.87	12.1	10.6	14.8	14.8	16.8	16.8	17.7	17.7	21.1	21.1
		kW	1.44	1.53	1.61	1.67	1.69	1.77	1.85	1.91	1.94	2.03	2.22	2.32	2.32	2.35	2.35	2.38	2.38	2.41	2.41	2.41
675	60	Cap.	4.76	4.38	6.26	5.76	8.01	7.35	9.44	8.61	10.1	9.17	12.6	11.0	15.3	15.3	17.5	17.5	18.5	18.5	22.1	22.1
		kW	1.27	1.32	1.36	1.39	1.41	1.46	1.50	1.54	1.56	1.62	1.77	1.87	1.87	1.90	1.90	1.93	1.93	1.96	1.96	1.96
	70	Cap.	4.68	4.31	6.16	5.66	7.93	7.28	9.30	8.48	9.97	9.04	12.4	10.8	15.1	15.1	17.2	17.2	18.2	18.2	21.6	21.6
		kW	1.37	1.43	1.48	1.51	1.53	1.59	1.64	1.68	1.70	1.76	1.91	1.91	1.94	1.94	1.97	1.97	2.00	2.00	2.03	2.03
	80	Cap.	4.63	4.26	6.11	5.62	7.83	7.18	9.22	8.41	9.85	8.93	12.2	10.7	14.9	14.9	16.9	16.9	17.9	17.9	21.3	21.3
		kW	1.46	1.54	1.60	1.65	1.66	1.73	1.79	1.83	1.85	1.93	2.08	2.18	2.18	2.21	2.21	2.24	2.24	2.27	2.27	2.27
750	60	Cap.	4.84	4.45	6.30	5.80	8.08	7.41	9.49	8.66	10.2	9.23	12.6	11.0	15.4	15.4	17.6	17.6	18.5	18.5	22.2	22.2
		kW	1.29	1.33	1.37	1.39	1.41	1.45	1.50	1.53	1.54	1.60	1.75	1.85	1.85	1.88	1.88	1.91	1.91	1.94	1.94	1.94
	70	Cap.	4.78	4.40	6.21	5.72	7.98	7.32	9.38	8.55	10.0	9.09	12.4	10.9	15.2	15.2	17.3	17.3	18.3	18.3	21.8	21.8
		kW	1.38	1.43	1.48	1.51	1.53	1.58	1.63	1.66	1.68	1.74	1.89	1.99	1.99	2.02	2.02	2.05	2.05	2.08	2.08	2.08
	80	Cap.	4.71	4.33	6.15	5.66	7.87	7.23	9.27	8.45	9.89	8.97	12.2	10.7	14.9	14.9	17.0	17.0	18.0	18.0	21.4	21.4
		kW	1.48	1.54	1.60	1.64	1.66	1.72	1.77	1.81	1.83	1.90	2.05	2.15	2.15	2.18	2.18	2.21	2.21	2.24	2.24	2.24

### 50YX024 (2 Tons)

Cfm (Std Air)	Return Air (F db)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
			-10	0	10	17	20	30	40	47	50	60										
800	60	Cap.	6.37	5.86	8.21	7.55	10.3	9.49	12.1	11.0	12.9	11.7	15.8	13.9	19.1	19.1	21.6	21.6	22.8	22.8	27.0	27.0
		kW	1.69	1.75	1.80	1.84	1.85	1.90	1.93	1.96	1.97	2.01	2.16	2.26	2.26	2.29	2.29	2.32	2.32	2.35	2.35	2.35
	70	Cap.	6.23	5.73	8.07	7.43	10.2	9.37	11.9	10.9	12.7	11.5	15.6	13.7	19.0	19.0	21.4	21.4	22.6	22.6	26.7	26.7
		kW	1.79	1.88	1.95	2.00	2.01	2.07	2.12	2.16	2.17	2.22	2.37	2.47	2.47	2.50	2.50	2.53	2.53	2.56	2.56	2.56
	80	Cap.	6.08	5.59	7.96	7.32	10.1	9.27	11.8	10.8	12.6	11.4	15.5	13.6	18.7	18.7	21.2	21.2	22.4	22.4	26.4	26.4
		kW	1.88	2.01	2.10	2.17	2.19	2.26	2.33	2.37	2.39	2.45	2.60	2.70	2.70	2.73	2.73	2.76	2.76	2.79	2.79	2.79
900	60	Cap.	6.45	5.93	8.28	7.62	10.4	9.57	12.2	11.1	13.0	11.8	15.9	13.9	19.2	19.2	21.8	21.8	23.0	23.0	27.1	27.1
		kW	1.71	1.77	1.82	1.85	1.86	1.90	1.93	1.95	1.96	2.01	2.16	2.26	2.26	2.29	2.29	2.32	2.32	2.35	2.35	2.35
	70	Cap.	6.31	5.81	8.15	7.50	10.3	9.44	12.0	10.9	12.8	11.6	15.7	13.7	19.0	19.0	21.5	21.5	22.6	22.6	26.8	26.8
		kW	1.81	1.89	1.96	2.00	2.01	2.06	2.10	2.13	2.14	2.18	2.33	2.43	2.43	2.46	2.46	2.49	2.49	2.52	2.52	2.52
	80	Cap.	6.16	5.67	8.03	7.39	10.2	9.34	11.9	10.8	12.7	11.5	15.6	13.6	18.8	18.8	21.3	21.3	22.5	22.5	26.5	26.5
		kW	1.91	2.03	2.11	2.17	2.19	2.26	2.32	2.35	2.36	2.41	2.56	2.66	2.66	2.69	2.69	2.72	2.72	2.75	2.75	2.75
1000	60	Cap.	6.53	6.00	8.38	7.71	10.5	9.66	12.3	11.2	13.1	11.8	16.0	14.0	19.4	19.4	22.0	22.0	23.1	23.1	27.2	27.2
		kW	1.74	1.79	1.83	1.86	1.87	1.90	1.93	1.95	1.96	2.01	2.16	2.26	2.26	2.29	2.29	2.32	2.32	2.35	2.35	2.35
	70	Cap.	6.40	5.88	8.24	7.58	10.4	9.51	12.1	11.0	12.9	11.7	15.8	13.8	19.1	19.1	21.6	21.6	22.8	22.8	26.8	26.8
		kW	1.84	1.92	1.97	2.01	2.02	2.06	2.10	2.13	2.13	2.16	2.31	2.41	2.41	2.44	2.44	2.47	2.47	2.50	2.50	2.50
	80	Cap.	6.24	5.74	8.11	7.46	10.3	9.42	11.9	10.9	12.7	11.5	15.6	13.7	18.8	18.8	21.3	21.3	22.6	22.6	26.7	26.7
		kW	1.94	2.05	2.13	2.17	2.19	2.25	2.30	2.32	2.33	2.38	2.53	2.63	2.63	2.66	2.66	2.69	2.69	2.72	2.72	2.72

#### LEGEND

**Cap.** — Heating Capacity (1000 Btu/h) (Includes Indoor-Fan Motor Heat)  
**db** — Dry Bulb  
**kW** — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)  
**rh** — Relative Humidity

#### NOTES:

- 1 Shading indicates integrated ratings.
- 2 Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

# Performance data (cont)

## HEATING CAPACITIES (cont)

### 50YX030 (2½ Tons)

Cfm (Std Air)	Return Air (F db)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		- 10		0		10		17		20		30		40		47		50		60		
1000	60	Cap.	9.61	8.84	12.0	11.0	14.6	13.4	16.8	15.3	17.9	16.2	21.6	18.9	25.8	25.8	29.3	29.3	30.5	30.5	35.5	35.5
		kW	2.05		2.13		2.20		2.26		2.29		2.38		2.47		2.54		2.56		2.66	
	70	Cap.	9.51	8.75	12.0	11.0	14.6	13.4	16.7	15.2	17.7	16.1	21.4	18.7	25.5	25.5	28.8	28.8	30.0	30.0	35.2	35.2
		kW	2.20		2.32		2.41		2.45		2.48		2.59		2.69		2.76		2.79		2.93	
	80	Cap.	9.05	8.32	11.9	11.0	14.6	13.4	16.8	15.3	17.8	16.1	21.3	18.7	25.4	25.4	28.6	28.6	29.9	29.9	34.8	34.8
		kW	2.28		2.51		2.62		2.72		2.75		2.85		2.97		3.05		3.08		3.20	
1125	60	Cap.	9.70	8.92	12.1	11.1	14.7	13.5	16.9	15.4	18.0	16.3	21.7	19.0	25.9	25.9	29.4	29.4	30.5	30.5	35.6	35.6
		kW	2.08		2.15		2.21		2.27		2.29		2.38		2.45		2.51		2.53		2.62	
	70	Cap.	9.62	8.85	12.1	11.1	14.6	13.4	16.8	15.3	17.8	16.2	21.4	18.8	25.7	25.7	29.0	29.0	30.2	30.2	35.3	35.3
		kW	2.22		2.33		2.41		2.46		2.49		2.57		2.68		2.74		2.77		2.87	
	80	Cap.	9.21	8.47	12.0	11.1	14.7	13.5	16.8	15.3	17.8	16.1	21.3	18.7	25.4	25.4	28.6	28.6	29.9	29.9	35.0	35.0
		kW	2.32		2.53		2.63		2.69		2.72		2.81		2.92		2.99		3.02		3.15	
1250	60	Cap.	9.79	9.01	12.6	11.6	14.8	13.6	17.0	15.5	18.1	16.4	21.8	19.1	26.1	26.1	29.6	29.6	30.8	30.8	35.9	35.9
		kW	2.10		2.17		2.23		2.28		2.30		2.37		2.45		2.51		2.52		2.60	
	70	Cap.	9.73	8.95	12.1	11.2	14.8	13.5	16.9	15.4	17.9	16.3	21.6	18.9	25.7	25.7	29.2	29.2	30.4	30.4	35.4	35.4
		kW	2.25		2.35		2.41		2.47		2.50		2.57		2.66		2.73		2.76		2.83	
	80	Cap.	9.41	8.66	12.1	11.2	14.8	13.6	16.9	15.4	17.9	16.2	21.5	18.8	25.4	25.4	28.8	28.8	30.1	30.1	35.0	35.0
		kW	2.36		2.55		2.64		2.70		2.73		2.82		2.89		2.98		3.00		3.10	

### 50YX036 (3 Tons)

Cfm (Std Air)	Return Air (F db)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		- 10		0		10		17		20		30		40		47		50		60		
1200	60	Cap.	10.1	9.34	13.1	12.1	16.4	15.1	19.1	17.4	20.4	18.5	24.9	21.8	30.1	30.1	34.3	34.3	35.9	35.9	42.4	42.4
		kW	2.30		2.44		2.56		2.64		2.70		2.83		2.97		3.06		3.10		3.25	
	70	Cap.	9.90	9.10	12.8	11.8	16.2	14.8	18.9	17.3	20.2	18.3	24.6	21.6	29.8	29.8	34.0	34.0	35.6	35.6	42.1	42.1
		kW	2.47		2.64		2.81		2.93		2.97		3.09		3.27		3.40		3.44		3.61	
	80	Cap.	9.56	8.80	12.5	11.5	15.9	14.6	18.7	17.0	20.0	18.1	24.4	21.4	29.6	29.6	33.6	33.6	35.4	35.4	41.7	41.7
		kW	2.61		2.85		3.04		3.18		3.24		3.42		3.63		3.78		3.83		4.02	
1350	60	Cap.	10.2	9.43	13.2	12.2	16.5	15.2	19.2	17.5	20.4	18.5	25.0	21.9	30.2	30.2	34.5	34.5	36.1	36.1	42.6	42.6
		kW	2.32		2.46		2.57		2.64		2.68		2.79		2.92		3.04		3.07		3.20	
	70	Cap.	10.1	9.30	13.0	12.0	16.4	15.0	19.0	17.3	20.2	18.3	24.7	21.7	29.9	29.9	34.0	34.0	35.7	35.7	42.3	42.3
		kW	2.50		2.67		2.79		2.90		2.93		3.08		3.21		3.33		3.37		3.55	
	80	Cap.	10.6	9.71	13.1	12.1	16.2	14.9	18.8	17.1	20.1	18.2	24.5	21.4	29.6	29.6	33.7	33.7	35.4	35.4	42.0	42.0
		kW	2.65		2.88		3.07		3.18		3.24		3.37		3.56		3.70		3.75		3.95	
1500	60	Cap.	10.5	9.64	13.4	12.3	16.6	15.3	19.4	17.7	20.6	18.7	25.1	22.0	30.2	30.2	34.5	34.5	36.2	36.2	42.9	42.9
		kW	2.35		2.47		2.58		2.66		2.69		2.80		2.89		3.00		3.03		3.18	
	70	Cap.	10.3	9.48	13.2	12.2	16.5	15.2	19.1	17.4	20.4	18.5	24.9	21.8	30.0	30.0	34.1	34.1	35.8	35.8	42.3	42.3
		kW	2.52		2.66		2.81		2.88		2.95		3.08		3.20		3.29		3.32		3.49	
	80	Cap.	10.7	9.81	13.0	12.0	16.3	15.0	19.0	17.3	20.2	18.3	24.7	21.6	29.7	29.7	33.8	33.8	35.5	35.5	42.0	42.0
		kW	2.68		2.88		3.05		3.16		3.25		3.38		3.51		3.64		3.68		3.87	

#### LEGEND

Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)  
 db — Dry Bulb  
 kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input and Indoor-Fan Motor Input)  
 rh — Relative Humidity

#### NOTES:

1. Shading indicates integrated ratings
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it

### HEATING CAPACITIES (cont)

#### 50YX042 (3½ Tons)

Cfm (Std Air)	Return Air (F db)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
			-10	0	10	17	20	30	40	47	50	60										
1225	60	Cap.	11.4	10.5	14.6	13.5	18.5	17.0	21.7	19.7	23.1	20.9	28.2	24.7	34.2	34.2	38.9	38.9	40.8	40.8	48.1	48.1
		kW	2.59		2.70		2.81		2.89		2.93		3.05		3.18		3.27		3.31		3.46	
	70	Cap.	11.1	10.2	14.4	13.2	18.2	16.7	21.3	19.4	22.7	20.6	27.8	24.4	33.7	33.7	38.3	38.3	40.2	40.2	47.3	47.3
		kW	2.77		2.92		3.06		3.15		3.19		3.33		3.48		3.59		3.63		3.79	
	80	Cap.	10.8	9.93	14.1	13.0	17.9	16.5	21.0	19.1	22.4	20.3	27.4	24.0	33.2	33.2	37.6	37.6	39.5	39.5	46.5	46.5
		kW	2.94		3.13		3.31		3.42		3.47		3.63		3.80		3.92		3.97		4.14	
1400	60	Cap.	11.5	10.6	14.8	13.6	18.7	17.2	21.8	19.9	23.3	21.1	28.5	24.9	34.3	34.3	39.3	39.3	41.2	41.2	48.6	48.6
		kW	2.62		2.72		2.82		2.89		2.92		3.03		3.14		3.23		3.26		3.39	
	70	Cap.	11.2	10.3	14.5	13.4	18.4	16.9	21.5	19.6	22.9	20.8	28.0	24.6	34.0	34.0	38.6	38.6	40.5	40.5	47.8	47.8
		kW	2.80		2.94		3.06		3.15		3.18		3.31		3.44		3.53		3.57		3.71	
	80	Cap.	11.0	10.1	14.3	13.1	18.1	16.6	21.2	19.3	22.5	20.4	27.6	24.2	33.5	33.5	37.9	37.9	39.9	39.9	46.9	46.9
		kW	2.97		3.16		3.31		3.42		3.46		3.61		3.76		3.86		3.91		4.06	
1650	60	Cap.	11.7	10.8	15.1	13.9	18.9	17.4	22.1	20.1	23.5	21.3	28.8	25.2	34.7	34.7	39.7	39.7	41.6	41.6	49.1	49.1
		kW	2.67		2.76		2.85		2.91		2.94		3.03		3.12		3.20		3.23		3.35	
	70	Cap.	11.4	10.5	14.8	13.6	18.6	17.1	21.7	19.8	23.1	21.0	28.4	24.8	34.4	34.4	39.0	39.0	40.9	40.9	48.3	48.3
		kW	2.85		2.98		3.09		3.16		3.20		3.30		3.42		3.50		3.53		3.65	
	80	Cap.	11.1	10.3	14.5	13.3	18.4	16.9	21.4	19.5	22.8	20.7	27.9	24.5	33.8	33.8	38.3	38.3	40.3	40.3	47.5	47.5
		kW	3.03		3.20		3.34		3.43		3.47		3.60		3.73		3.82		3.86		3.99	

#### 50YX048 (4 Tons)

Cfm (Std Air)	Return Air (F db)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
			-10	0	10	17	20	30	40	47	50	60										
1400	60	Cap.	15.4	14.2	19.2	17.6	23.5	21.5	26.8	24.5	28.4	25.8	34.1	29.8	40.5	40.5	46.1	46.1	47.7	47.7	55.6	55.6
		kW	3.33		3.43		3.53		3.60		3.63		3.71		3.83		3.91		3.93		4.04	
	70	Cap.	15.1	13.9	18.9	17.4	23.2	21.3	26.6	24.2	28.2	25.6	33.7	29.6	40.1	40.1	45.7	45.7	47.3	47.3	55.3	55.3
		kW	3.57		3.72		3.85		3.94		3.99		4.08		4.19		4.33		4.35		4.47	
	80	Cap.	14.8	13.6	18.6	17.1	22.9	21.0	26.3	24.0	27.9	25.3	33.5	29.4	39.8	39.8	45.3	45.3	47.0	47.0	54.9	54.9
		kW	3.79		4.00		4.18		4.28		4.33		4.51		4.64		4.79		4.81		4.95	
1600	60	Cap.	15.6	14.4	19.4	17.8	23.6	21.7	27.0	24.6	28.6	26.0	34.3	30.0	40.6	40.6	46.2	46.2	47.8	47.8	55.8	55.8
		kW	3.38		3.48		3.55		3.61		3.63		3.71		3.79		3.86		3.87		3.97	
	70	Cap.	15.4	14.1	19.2	17.6	23.4	21.5	26.8	24.4	28.4	25.8	34.0	29.7	40.4	40.4	45.9	45.9	47.5	47.5	55.4	55.4
		kW	3.63		3.76		3.86		3.94		3.97		4.07		4.18		4.26		4.27		4.38	
	80	Cap.	15.0	13.8	18.8	17.3	23.1	21.2	26.5	24.2	28.1	25.5	33.7	29.5	40.0	40.0	45.4	45.4	47.2	47.2	55.0	55.0
		kW	3.85		4.05		4.21		4.30		4.35		4.46		4.57		4.71		4.73		4.84	
1800	60	Cap.	15.9	14.6	19.6	18.0	23.9	21.9	27.2	24.8	28.8	26.1	34.5	30.2	40.9	40.9	46.6	46.6	48.1	48.1	55.9	55.9
		kW	3.44		3.53		3.60		3.64		3.66		3.73		3.79		3.86		3.87		3.92	
	70	Cap.	15.6	14.4	19.4	17.8	23.6	21.7	27.0	24.6	28.6	25.9	34.2	29.9	40.5	40.5	46.0	46.0	47.6	47.6	55.6	55.6
		kW	3.69		3.80		3.91		3.95		4.00		4.08		4.15		4.21		4.23		4.32	
	80	Cap.	15.3	14.0	19.1	17.5	23.4	21.5	26.8	24.4	28.3	25.7	33.9	29.7	40.2	40.2	45.6	45.6	47.3	47.3	55.2	55.2
		kW	3.91		4.10		4.23		4.32		4.35		4.46		4.58		4.65		4.67		4.77	

#### LEGEND

- Cap. — Heating Capacity (1000 Btuh) (Includes Indoor-Fan Motor Heat)
- db — Dry Bulb
- kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input, and Indoor-Fan Motor Input)
- rh — Relative Humidity

#### NOTES:

1. Shading indicates integrated ratings.
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

# Performance data (cont)

## HEATING CAPACITIES (cont)

50YX060 (5 Tons)																						
Cfm (Std Air)	Return Air (F db)	Temperature Air Entering Outdoor Coil (F db at 70% rh)																				
		-10		0		10		17		20		30		40		47		50		60		
1750	60	Cap.	17.6	16.2	21.9	20.1	26.8	24.6	30.8	28.1	32.7	29.7	39.4	34.5	47.3	47.3	54.3	54.3	56.1	56.1	66.0	66.0
		kW	4.00		4.14		4.26		4.36		4.40		4.55		4.73		4.87		4.89		5.09	
	70	Cap.	17.5	16.1	21.7	20.0	26.7	24.5	30.7	28.0	32.5	29.5	39.3	34.4	47.0	47.0	53.8	53.8	55.7	55.7	65.5	65.5
		kW	4.28		4.45		4.62		4.74		4.78		4.96		5.15		5.30		5.33		5.56	
	80	Cap.	17.4	16.0	21.6	19.9	26.6	24.4	30.6	27.9	32.4	29.4	39.1	34.2	46.8	46.8	53.3	53.3	55.4	55.4	65.2	65.2
		kW	4.57		4.79		5.00		5.14		5.20		5.39		5.61		5.78		5.83		6.08	
2000	60	Cap.	17.9	16.4	22.1	20.4	27.1	24.8	31.1	28.3	33.0	29.9	39.7	34.8	47.5	47.5	54.6	54.6	56.5	56.5	66.4	66.4
		kW	4.08		4.20		4.32		4.41		4.45		4.58		4.73		4.86		4.90		5.06	
	70	Cap.	17.7	16.3	22.0	20.3	27.0	24.8	31.0	28.3	32.8	29.7	39.5	34.6	47.3	47.3	54.5	54.5	56.0	56.0	65.9	65.9
		kW	4.36		4.53		4.67		4.78		4.82		4.98		5.14		5.32		5.35		5.51	
	80	Cap.	17.6	16.2	21.9	20.1	26.8	24.6	30.8	28.1	32.7	29.6	39.3	34.4	47.0	47.0	53.5	53.5	55.6	55.6	65.3	65.3
		kW	4.66		4.86		5.04		5.18		5.23		5.39		5.59		5.74		5.79		6.01	
2250	60	Cap.	18.1	16.7	22.4	20.6	27.3	25.1	31.4	28.6	33.3	30.2	40.0	35.0	47.8	47.8	54.8	54.8	56.7	56.7	66.6	66.6
		kW	4.17		4.28		4.39		4.48		4.51		4.63		4.76		4.88		4.91		5.06	
	70	Cap.	18.1	16.7	22.3	20.5	27.3	25.0	31.3	28.5	33.1	30.0	39.8	34.9	47.5	47.5	54.3	54.3	56.3	56.3	66.1	66.1
		kW	4.46		4.61		4.74		4.83		4.87		5.02		5.16		5.28		5.32		5.49	
	80	Cap.	17.9	16.5	22.2	20.4	27.1	24.9	31.1	28.3	32.9	29.9	39.6	34.7	47.2	47.2	53.7	53.7	55.9	55.9	65.7	65.7
		kW	4.74		4.94		5.12		5.23		5.28		5.45		5.60		5.73		5.78		5.98	

LEGEND

NOTES:

- Cap. — Heating Capacity (1000 Btu/h) (Includes Indoor-Fan Motor Heat)
- db — Dry Bulb
- kW — Total Power Input (Includes Compressor Motor Power Input, Outdoor-Fan Motor Input and Indoor-Fan Motor Input)
- rh — Relative Humidity

1. Shading indicates integrated ratings
2. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

### AIR DELIVERY\* (Cfm) PERFORMANCE (Deduct 8% for 208 V)

50YX UNIT SIZE	UNIT VOLTAGE (Single Phase)	INDOOR-FAN MOTOR SPEED	COIL	EXTERNAL STATIC PRESSURE (in. wg)										
				0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	230	Low	Dry	—	—	810	710	620	520	420	—	—	—	—
			Wet	—	—	785	685	600	500	405	—	—	—	—
024	230	Low	Dry	1450	1410	1375	1320	1345	1175	1090	985	850	760	—
			Wet	1390	1340	1290	1225	1165	1105	1020	915	740	—	—
030	230	Low	Dry	—	—	1425	1360	1295	1235	1160	1080	995	925	815
			Wet	—	—	1380	1315	1250	1190	1125	1045	960	895	790
036	230	Low	Dry	—	—	1440	1400	1345	1290	1225	1140	1040	930	—
			Wet	—	—	1400	1365	1290	1240	1185	1090	990	890	—
042	230	Low	Dry	—	1695	1655	1580	1495	1425	1310	1160	1000	725	—
			Wet	—	1650	1625	1550	1475	1400	1280	1130	960	680	—
048	230	Low	Dry	—	1900	1850	1745	1600	1525	1430	1275	1170	950	—
			Wet	—	1855	1820	1715	1590	1510	1400	1250	1095	895	—
060	230	Low	Dry	1540	1507	1480	1430	1380	1350	1300	1260	1210	1155	1100
			Wet	1400	1370	1345	1300	1260	1230	1195	1150	1100	1050	1000
060	230	Med	Dry	1960	1915	1885	1830	1780	1725	1655	1600	1540	1470	1400
			Wet	1895	1880	1850	1795	1745	1690	1620	1565	1510	1445	1375
060	230	High	Dry	2230	2160	2120	2070	2010	1950	1890	1820	1750	1675	1590
			Wet	2145	2105	2060	2000	1940	1880	1820	1750	1690	1615	1540
060	230	High	Dry	2305	2270	2230	2165	2125	2060	1980	1905	1850	1755	1700
			Wet	2275	2240	2200	2135	2095	2050	1950	1875	1820	1725	1670

\*Heating airflows with dry coil; cooling airflows with wet coil

NOTES:

1. Air delivery values are based on 230-v unit operating voltage without air filter or optional electric heaters. Deduct field-supplied air filter and electric heater pressure drop to obtain external static pressure available for ducting
2. Dashes indicate portions of table that are beyond indoor-fan motor capability

3. Do not operate unit at a cooling airflow less than 350 cfm for each 12,000 Btu/h of rated cooling capacity. Operation at airflow below this point may result in frost on indoor coil
4. See Minimum Airflow (Cfm) for Safe Electric Heater Operation table on page 13 for minimum airflow required for field-installed electric heaters.

**ELECTRIC HEAT ACCESSORY PRESSURE DROP (in. wg)**

HEATER kW	CFM								
	600	800	1000	1200	1400	1600	1800	2000	2200
5.0, 7.5, 10.0	.020	.030	.040	.045	.050	.055	.060	.070	.080
15.0, 20.0, 25.0	—	—	.050	.055	.060	.070	.080	.090	.100

**ELECTRIC HEATER PACKAGES**

50YX UNIT SIZE	HEATER PART NO.	HEATER V-PH	kW	BRANCH CIRCUIT							
				Heater Amps	Minimum Circuit Ampacity	MOCP Amps	Stages*	Elements	Power Wire Size†	Ground Wire Size	Capacity (MBtuh)
018-060	88EM0050MA00	240-1	5.0	20.8	26.0	30	1	1	10	10	17.1
	88EM0075MA00		7.5	31.3	39.1	40	1	2	8	10	25.6
	88EM0100MA00		10.0	41.6	52.0	60	1	2	6	10	34.1
030-060	88EM0150MA00		15.0	62.5	78.1	80	2	3	3	8	51.2
036-060	88EM0200MA00		20.0	83.3	104.2	110	2	4	2**	6	68.2
060	88EM0250MA00		25.0	104.0	130.0	150	3	5	1**	6	85.4

**LEGEND**

**HACR** — Heating, Air Conditioning, and Refrigeration  
**MOCP** — Maximum Overcurrent Protection  
 (Fuses or HACR-Type Circuit Breaker)

\*The va draw per stage is 6.2

†Wire size based on 60 C copper conductors unless otherwise noted.

\*\*Wire size based on 75 C copper conductor.

NOTE: The heater kW ratings shown above are at 240 v Use the following table to determine heater capacity for your particular voltage:

HEATER kW RATING	VOLTAGE DISTRIBUTION V-1-60	MULTIPLICATION FACTOR
240	208	.75
	230	.92

**MINIMUM AIRFLOW (CFM) FOR SAFE ELECTRIC HEATER OPERATION**

50YX UNIT SIZE	018	024	030	036	042	048	060
Airflow (Cfm)	600	875	875	1300	1400	1650	1800

# Electrical data

## SINGLE POINT BOX ELECTRICAL DATA

UNIT SIZE 50YX	BASE UNIT V-PH	BASE UNIT MCA	UNIT FUSE SIZE	ELECTRIC HEATER KW AT		ELECTRIC HEATER V-PH	ELECTRIC HEATER MCA	ELECTRIC HEATER FUSE SIZE	TOTAL MCA (Base Unit and Electric Heater)	SINGLE POINT BOX PART NO.				
				208 V	240 V									
018	208/230-1	16.6	25	3.75	5.0	208/240-1	22.5/26.0	25/30	39.1/ 42.6	50YX-900---001				
				5.6	7.5					50YX-900---002				
				7.5	10.0					50YX-900---002				
024	208/230-1	21.0	30	3.75	5.0	208/240-1	22.5/26.0	25/30	43.5/ 47.0	50YX-900---001				
				5.6	7.5					50YX-900---002				
				7.5	10.0					50YX-900---002				
030	208/230-1	24.5	35	3.75	5.0	208/240-1	22.5/26.0	25/30	47.0/ 50.5	50YX-900---002				
				5.6	7.5					50YX-900---003				
				7.5	10.0					50YX-900---003				
				11.3	15.0					50YX-900---004				
036	208/230-1	30.7	50	3.75	5.0	208/240-1	22.5/26.0	25/30	53.2/ 56.7	50YX-900---002				
				5.6	7.5					50YX-900---003				
				7.5	10.0					50YX-900---003				
				11.3	15.0					50YX-900---004				
042	208/230-1	33.2	50	15.0	—	208-1**	90.1	100	120.8†	50YX-900---004				
				3.75	5.0	208/240-1	22.5/26.0	25/30	55.7/ 59.2	50YX-900---002				
				5.6	7.5					50YX-900---003				
				7.5	10.0					50YX-900---003				
048	208/230-1	39.9	60	11.3	15.0	208/240-1	67.6/78.1	70/80	100.8*/111.3*	50YX-900---004				
				15.0	—					208-1**	90.1	100	123.3†	50YX-900---004
				3.75	5.0					208/240-1	22.5/26.0	25/30	62.4/ 65.9	50YX900---002
				5.6	7.5	208/240-1	33.8/39.1	35/40	73.7/113.6	50YX900---003				
060	208/230-1	49.8	60	7.5	10.0	208/240-1	45.1/52.0	50/60	85.0/ 91.9	50YX900---003				
				11.3	15.0					208/240-1	67.6/78.1	70/80	107.5*/147.4†	50YX900---004
				15.0	—					208-1**	90.1	100	139.9†	50YX900---004
				8.75	5.0	208/240-1	22.5/26.0	25/30	72.3/ 75.8	50YX900---002				
060	208/230-1	49.8	60	5.6	7.5	208/240-1	33.8/39.1	35/40	83.6/ 88.9	50YX900---003				
				7.5	10.0					208/240-1	45.1/52.0	50/60	94.9/101.8*	50YX900---003
				11.3	15.0					208/240-1	67.6/78.1	70/80	117.4†/127.9†	50YX900---004
				15.0	—	208-1**	90.1	100	139.8	50YX900---004				

### LEGEND

**AWG** — American Wire Gage  
**MCA** — Minimum Circuit Amps  
**NEC** — National Electrical Code  
**UL** — Underwriters' Laboratories

\*75 C copper conductor required.

†90 C copper conductor required

\*\*For 208-v usage only.

### NOTES:

1. Maximum field wire size should be no. 2 AWG.
2. All ampacities above (unless otherwise noted) will allow use of a 60 C copper conductor at 86 F ambient temperature.
3. All values shown for MCA and fuses are calculated per UL 1995 and comply with the NEC.
4. Single point boxes are not available for 25 kW electric heaters.

## Electrical data (cont)

50YX UNIT SIZE	V-PH-HZ	OPERATING VOLTAGE*		COMPRESSOR		IFM FLA	OFM FLA	MCA	MAX FUSE† OR HACR CKT BKR AMPS
		Max	Min	LRA	RLA				
018	208/230-1-60	254	187	50.0	10.7	1.8	1.4	16.6	25
024				62.5	12.9	3.5	1.4	21.0	30
030				76.0	15.0	3.5	2.2	24.5	35
036				90.5	20.0	3.5	2.2	30.7	50
042				107.0	22.0	3.5	2.2	33.2	50
048				129	26.4	4.7	2.2	39.9	60
060				169	32.2	6.7	2.8	49.8	60

### LEGEND

CKT BKR	—	Circuit Breaker
FLA	—	Full Load Amps
HACR	—	Heating, Air Conditioning, and Refrigeration
IFM	—	Indoor-Fan Motor
LRA	—	Locked Rotor Amps
MCA	—	Minimum Circuit Amps
OFM	—	Outdoor-Fan Motor
RLA	—	Rated Load Amps

\*Permissible limits of the voltage range at which units will operate satisfactorily.

†Maximum dual element fuse.

NOTE. Use copper wire only.



## Controls

### Operating sequence

When power is supplied to unit, the transformer (TRAN) is energized.

**Cooling** — With the thermostat subbase in the cooling position, and when the space temperature comes within 2° F of the cooling set point, the thermostat makes circuit R-O. This energizes the reversing valve solenoid (RVS) and places the unit in standby condition for cooling.

As the stage temperature continues to rise, the second stage of the thermostat makes, closing circuit R-Y through the low-pressure switch (LPS). When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to contactor (C), starting the compressor (COMP) and outdoor-fan motor (OFM). Circuit R-G is made at the same time, energizing the indoor-fan relay (IFR) and starting the indoor-fan motor (IFM) after one-second delay.

When the thermostat is satisfied, contacts open, deenergizing C. The COMP and OFM stop, and the IFM stops after a 45-second time delay.

**Heating** — On a call for heat, thermostat makes circuits R-Y and R-G. Circuit R-Y is completed, allowing circuit through LPS. When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to C, starting COMP and OFM. Circuit R-G also is completed, energizing IFR and starting IFM after one-second delay.

Should room temperature continue to fall, circuit R-W is made through second-stage thermostat bulb. If optional electric heat package is used, a relay is energized, bringing on first bank of supplemental electric heat. When thermostat is satisfied, contacts open, deenergizing contactor and relay; motors and heaters deenergize. The IFM is controlled by a time-delay relay that keeps the fan on for 45 seconds.

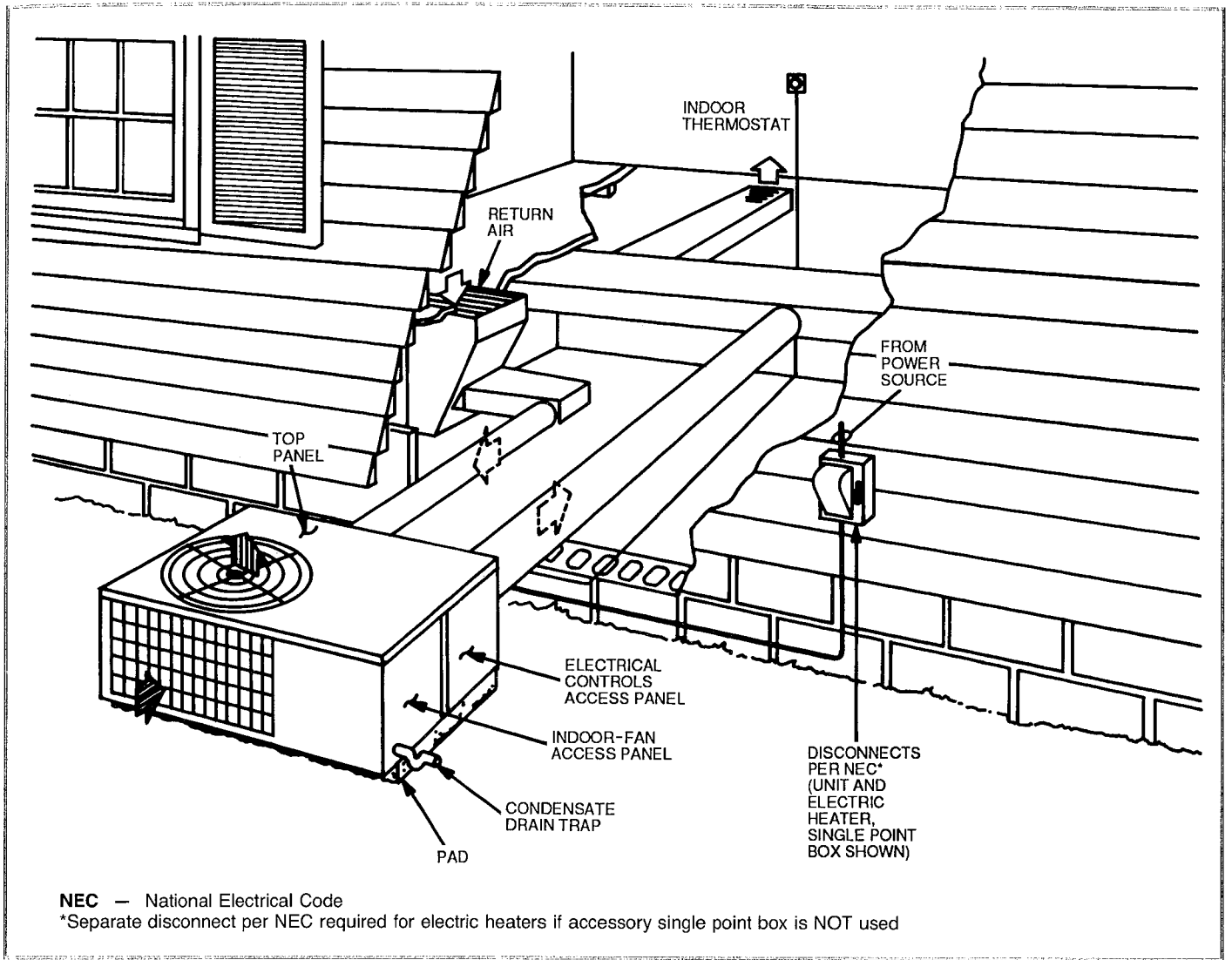
**Defrost** — Defrost board (DB) is a time and temperature control, which includes a field-selectable time period between checks for defrost (30, 50, and 90 minutes). Electronic timer and defrost cycle start only when contactor is energized and defrost thermostat (DFT) is closed.

Defrost mode is identical to cooling mode, except outdoor-fan motor stops and a bank of optional electric heat turns on to warm air supplying the conditioned space.





# Typical installation



# Guide specifications

## Packaged Rooftop Air-to-Air Heat Pump Constant Volume Applications

### HVAC Guide Specifications

Size Range: **1½ to 5 Tons, Nominal (Cooling)**  
**18,000 to 60,000 Btuh, Nominal**  
**(Heating)**

**Carrier Model Number: 50YX**

#### Part 1 — General

##### 1.01 SYSTEM DESCRIPTION

Outdoor package, electrically controlled, air-to-air heat pump utilizing a scroll compressor for heating and cooling duty. Unit shall discharge supply air horizontally as shown on contract drawings.

##### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standards 210, 240, and 270. Designed in accordance with UL 1995.
- B. Unit shall be designed to conform to ASHRAE 15.
- C. Unit shall be UL listed and CSA certified as a total package for safety requirements.
- D. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation

##### 1.03 DELIVERY, STORAGE, AND HANDLING

- A. Unit shall be stored and handled per manufacturer's recommendations

#### Part 2 — Products

##### 2.01 EQUIPMENT

###### A. General:

Factory-assembled, single piece, air-to-air heat pump. Contained within the unit enclosure shall be all factory wiring, piping, controls, and refrigerant charge (R-22).

###### B. Unit Cabinet:

1. Unit cabinet shall be constructed of phosphated, bonderized, zinc-coated, prepainted steel.
2. Indoor-fan compartment interior cabinet surfaces shall be insulated with a minimum ½-in thick, flexible fiberglass insulation, coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the heating compartment
3. Cabinet panels shall be easily removable for servicing.
4. Unit shall have a factory-installed condensate drain.

###### C. Fans:

1. Indoor Blower (Indoor Fan):
  - a. Fan shall be 2- or 3-speed direct drive as shown on the equipment drawings
  - b. Fan wheel shall be made from steel, be double-inlet type with forward-curved blades with a corrosion-resistant finish and shall be dynamically balanced.
2. Outdoor (condenser) fan shall be of the direct-driven propeller type with aluminum blades, riveted to corrosion-resistant steel spiders, shall be dynamically balanced, and shall discharge air vertically upwards.

###### D. Compressor

1. Fully hermetic scroll compressor with internal and external vibration isolation

###### E. Coils:

1. Indoor and outdoor coils shall have aluminum-plate fins mechanically bonded to seamless copper tubes with all joints brazed
2. Tube sheet openings shall be belled to prevent tube wear

###### F. Refrigerant Components.

1. Thermostatic expansion valve
2. Reversing valve.

###### G. Controls and Safeties

###### 1. Unit Controls:

- a. Unit shall be complete with self-contained low-voltage control circuit.
- b. Unit shall incorporate an outdoor coil defrost system to prevent excessive frost accumulation during heating duty, and shall be controlled as follows.
  - 1) Defrost shall be initiated on the basis of time and coil temperature.
  - 2) A 30/50/90 minute timer shall activate defrost cycle only if coil temperature is low enough to indicate a heavy frost condition
  - 3) Defrost cycle shall terminate when defrost thermostat is satisfied or shall have a positive termination time of 10 minutes
- c. Compressor shall be prevented from restarting for a minimum of 5 minutes after shutdown

###### 2. Safeties:

- a. Compressor, overtemperature, overcurrent.

###### H. Operating Characteristics:

1. Unit shall be capable of starting and running at 115 F ambient outdoor temperature per maximum load criteria of ARI Standard 210/240
2. Compressor with standard controls shall be capable of operation down to 55 F ambient outdoor temperature in cooling duty.
3. Compressor shall be capable of operation in heating duty down to -20 F ambient outdoor-air temperature.
4. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using electric heaters indicated in Section K, Special Features.

###### I. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location. Separate power supply is not required for electric heaters when accessory single point box is used.

###### J. Motors:

1. Compressor motors shall be of the refrigerant-cooled type with line break thermal and current overload protection
2. All fan motors shall have permanently lubricated bearings and inherent automatic reset thermal overload protection.

3 Outdoor-fan motor shall be open drip-proof

K. Special Features:

Certain standard features are not applicable when the features designated by \* are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.

1. Electric Resistance Heaters:

- a. Open-wire nichrome elements with all necessary safety and operating controls.
- b. Heaters are UL listed as indicated on basic unit informative plate.
- c. Each heater assembly shall include the following safety features:
  - 1) Automatic-reset switches.
  - 2) Heat limiters for primary and secondary, overcurrent, and thermal protection.

2 Service Sentry™ Kit:

Device provides immediate warning when the compressor fails to operate after a call for heating or cooling. The control energizes a warning light located on the indoor thermostat.

3. Outdoor Thermostat Kit:

Thermostat allows for staging of electric heaters based on outdoor-air temperature

4. Single Point Box Kit:

Kit allows for a single power supply for the packaged unit and accessory electric heat packages, and functions as an NEC-approved fused disconnect.

